

What is claimed is:

1. A system for virtually organizing content, content organizing structures, work items, and/or work organizing structures from a plurality of disparate content repositories and/or workflow systems, the system comprising:
  - 5 an application program interface (API) for interfacing with a software application written to provide access to the system; and
  - at least one virtual repository comprising a plurality of nodes that link to select items from the plurality of content repositories and/or workflow systems and provide organizational structure for the virtual repository.
- 10 2. The system of claim 1 wherein the content, content organizing structures, work items, and/or work organizing structures are not replicated or impacted by the creation of the at least one virtual repository.
- 15 3. The system of claim 1 wherein the existing organization, functions, indexing, and security of the content, content organizing structures, work items, and/or work organizing structures are not impacted by the creation of the at least one virtual repository.
- 20 4. The system of claim 1 wherein the API is in a format selected from the group consisting of Java, Component Object Model (COM), Simple Object Protocol (SOAP) Web Services, Representational State Transfer (REST) Web Services, and Web Development Components.

5. The system of claim 1 further comprising a graphical user interface or a web-based interface.
6. The system of claim 1 wherein the nodes are arranged in a parent-child hierarchy.
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7. The system of claim 1 wherein each node is of the type selected from the group consisting of links to repository content, links to repository folders, links to workflow system work items, links to workflow system work queues, virtual folders, folders populated by saved repository or workflow system searches, and links to external
- 10 resources via URLs.
8. The system of claim 1 wherein the nodes contain meta-data properties in addition to the meta-data maintained in their respective underlying content repositories and/or workflow systems that describe how the select items are used in the virtual repository.
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9. The system of claim 1 wherein the nodes have supplemental access control rules in addition to the access control rules maintained in their respective underlying content repositories and/or workflow systems, describing how the select items are secured in the virtual repository.
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10. The system of claim 1 wherein the at least one virtual repository can be exported to an XML representation and imported from the same XML representation.

11. The system of claim 1 further comprising a middleware platform to abstract the plurality of content repositories and/or workflow systems used in the at least one virtual repository.

5 12. The system of claim 1 further comprising a set of adaptors to allow the system to access specific content repositories and/or workflow systems.

13. The system of claim 1 further comprising an adaptor toolkit that enables the system to build interfaces to future developed content repositories and/or workflow  
10 systems.

14. A system for providing access to workflow in a plurality of disparate workflow systems having a plurality of proprietary program interfaces, the system comprising:  
an application program interface (API) for interfacing with a software application  
15 written to provide access to the system;  
an access services component that relays requests to access workflow items in the plurality of workflow systems from the API to a plurality of bridges; and  
a plurality of bridges that translate user requests into requests understandable by the proprietary program interfaces of the plurality of disparate workflow systems.

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15. The system of claim 14 wherein the API is in a format selected from the group consisting of Java, Component Object Model (COM), Simple Object Protocol (SOAP) Web Services, Representational State Transfer (REST) Web Services, and Web Development Components.

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16. The system of claim 14 further comprising a graphical user interface or a web-based interface.

17. The system of claim 14 further comprising a universal in-box that presents to the  
5 user the work items from the plurality of workflow systems intended for that single user based on the users' identity, role membership and group membership in each workflow system of the plurality of workflow systems.

18. The system of claim 14 wherein the access services component maps workflow  
10 meta-data properties across the plurality of workflow systems to a single common meta-data property by mapping the name, data type of the property and/or value transformation of the meta-data.

19. The system of claim 14 further comprising an exchange services server that  
15 enables import and export of workflow items and meta-data properties in the plurality of workflow systems.

20. The system of claim 14 wherein a single bridge corresponds to a single workflow system.

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21. The system of claim 14 further comprising a bridge factory that is configured to generate a new bridge to support each new workflow system.

22. The system of claim 14 wherein each bridge accesses the underlying workflow  
25 system via a mode selected from the group consisting of Java, Component Object Model

(COM), Java Native Interface (JNI) or Simple Object Access Protocol (SOAP) Web Services.

23. The system of claim 14 further comprising a universal workflow item attachment  
5 function that allows content, folders and/or work items from any other content repository  
and/or workflow system to be attached to a work item.

24. A system for creating rich relationships between two or more pieces of content,  
content organizing structures, work items and/or work organizing structures that exist in  
10 a plurality of content repositories, workflow systems and/or other external information  
sources, the system comprising an application program interface (API) for interfacing  
with a software application written to provide access to the system

wherein a system of nodes, members, and associations is used to describe the  
relationships between the two or more pieces of content, content organizing structures,  
15 work items and/or work organizing structures.

25. The system of claim 24 wherein the API is in a format selected from the group  
consisting of Java, Component Object Model (COM), Simple Object Protocol (SOAP)  
Web Services, Representational State Transfer (REST) Web Services, and Web  
20 Development Components.

26. The system of claim 24 further comprising a graphical user interface or a web-  
based interface.

27. The system of claim 24 wherein nodes represent content, content organizing structures, work items and/or work organizing structures that can participate in relationships with information selected from the group consisting of meta-data describing the node, roles played in associations with other nodes, 0 or more scoped names, a unique identifier of the subject of the node, a locator of the external subject of the node, and 0 or more node types.
28. The system of claim 24 wherein an association represents a relationship between two or more nodes.
29. The system of claim 28 wherein an association has two or more members which are nodes playing a specific named role in the association.
30. The system of claim 24 wherein members represent the specific role a node plays in an association.
31. The system of claim 30 wherein members have a player specifying the node playing the role in the association.
32. The system of claim 24 wherein associations can have 0 or more association types, wherein the association types have logical properties about the type of the relationship and are selected from the group consisting of allowed cardinality of the relationship, allowed members of the relationship, required members of the relationship, transitivity of the relationship, delete propagation across the relationship, and save propagation across the relationship.

33. The system of claim 24 further comprising locators to reference and de-reference entities external to the system, the locators being selected from the group consisting of a locator for external references that leverages content integration middleware to reference content or content organizing structures from one of a plurality of content repositories, a  
5 locator for external references that leverages workflow integration middleware to reference work items or work organizing structures from one of a plurality of workflow systems, and an extensible locator interface to enable locators for any external system
- 10 34. A system for providing for notification of one or more event handlers when additions, changes or deletions occur to any subscribed to content, content organizing structures, content repository searches, federated content repository searches, work items, work organizing structures, workflow system searches and/or federated workflow system searches that exist in a plurality of content repositories, workflow systems and/or  
15 other external information sources and comprising:
- an application program interface (API) for interfacing with a software application written to provide access to the system; and
  - subscriptions to content, content organizing structures, content repository searches, federated content repository searches, work items, work organizing structures,  
20 workflow system searches and/or federated workflow system searches;
- wherein the subscriptions are requests to track when additions, changes or deletions occur to any subscribed to content, content organizing structures, content repository searches, federated content repository searches, work items, work organizing structures, workflow system searches and/or federated workflow system searches.

35. The system of claim 34 wherein the subscriptions are stored with information selected from the group consisting of meta-data describing the subscription, stored and encrypted user credentials to be used when later detecting change of the subscribed item, stored state representation of the item from the last time it was monitored for change,  
5 with an XML version of the stored state representation, and with membership in a logical subscription group.

36. The system of claim 34 wherein the API is in a format selected from the group consisting of Java, Component Object Model (COM), Simple Object Protocol (SOAP)  
10 Web Services, Representational State Transfer (REST) Web Services, and Web Development Components.

37. The system of claim 34 further comprising a graphical user interface or a web-based interface.

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38. The system of claim 34 wherein logical groups organize like subscriptions with a common polling interval for a group or with a common event path for a group.

39. The system of claim 34 further comprising an event path defined per logical  
20 group comprising a timer, group processor, content monitor, event filter and event handler components.

40. The system of claim 39 wherein the timer initiates periodic polling of content repositories and workflow systems for change that needs notification.

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41. The system of claim 39 wherein the group processor initiates events on eligible subscriptions in a subscription group.
42. The system of claim 39 wherein the content monitor comprises a plug-in module  
5 for detecting change in monitored items.
43. The system of claim 39 wherein the event filter comprises plug-in modules for filtering interesting and uninteresting changes in monitored items.
- 10 44. The system of claim 39 wherein a subscription context is made available to event path plug-ins, content monitors, event filters, and event handlers with access selected from the group consisting of access to a live content integration middleware session, access to a live workflow integration middleware session, access to a statistics reporting API, access to an error reporting API, access to a logging API, and access to the active  
15 subscription for the plug-in.
45. The system of claim 34 further comprising a statistics module for gathering runtime statistics on events passing through each step of an event path and displaying said statistics.
- 20 46. The system of claim 34 wherein an event is created when a change is detected with the subscription for the event, meta-data describing the event, an event path the event will follow, and an open schema so that content repositories or workflow systems with internally defined event mechanisms can post events to the  
25 federated event system without polling for change.